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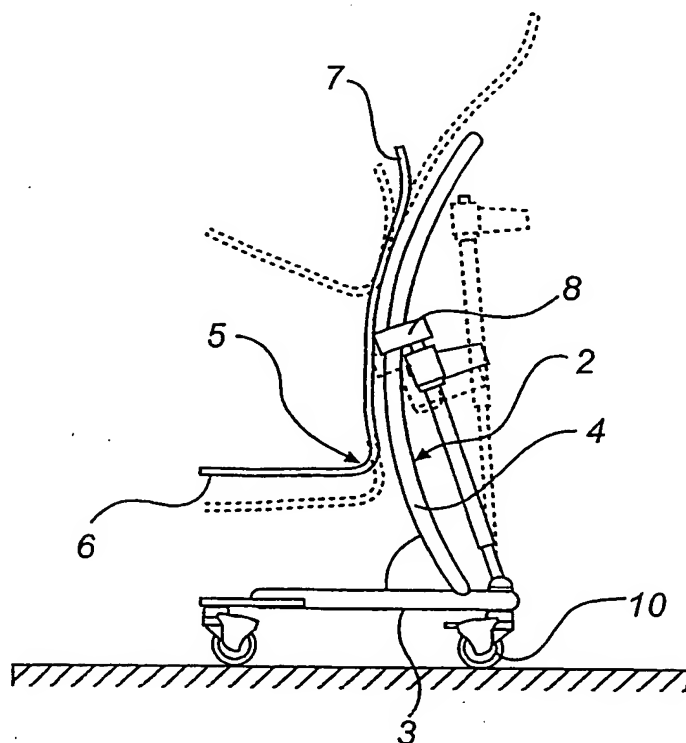
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(54) Title: **PATIENT CHAIR WITH A VERTICALLY MOVABLE SEAT**



(57) Abstract: A patient chair (1) has a chassis (2) with a frame (3), a seating device (6, 7) intended for the patient and connected to the chassis, and a driving device (9) for moving the seating device (6, 7) relative to the frame (3) in the vertical direction between a lower position (LP) and an upper position (HP), in which upper position the seating device (6, 7) and, thus, a patient sitting in it are inclined backwards relative to the lower position. A stand (4) belonging to the chassis (2) extends upwards from the frame (3), and an element (4, 7) connected to the stand (4) is continuously arched. Means (4, 7, 8) cooperating with each other and positioned on the stand (4, 7) and the seating device (6, 7) are arranged to guide the seating device (6, 7) along the element (4, 7) in the movement of the seating device between the lower and upper positions (LP, HP), so that the seating device (6, 7) is continuously gradually tilted in the course of its curved movement in the vertical direction.

PATIENT CHAIRTechnical Field of the Invention

The invention relates to a patient chair with a vertically movable seat according to the preamble to claim 1.

5 Prior-Art Technique

In nursing and home care, patient chairs are used, whose seat and, in many cases, back are movable as a unit between upper and lower positions. The movability is desirable and frequently a requirement made by carers
10 in order to be able in a fairly comfortable way, without straining their back, to move the patient between the patient chair and, for instance, a bed or a toilet.

A large number of patient chairs which more or less satisfy this requirement are available on the market and
15 described in the patent literature. Thus, patient chairs are known, which only allow said movement in a completely vertical direction. The drawback of these patient chairs is that it is difficult for the carer to take off/put on the patient's trousers, skirt, pants, napkin etc. or take
20 sanitary measures as regards the patient's genitals if the patient is sitting on the patient chair. Other prior-art patient chairs allow backward inclination of the seat and back unit and, thus, of the patient, in the course of the movement from the lower to the upper position, which
25 makes it easy to reach the patient's lower garments and genitals. The latter patient chair constructions, however, are complicated and thus expensive to manufacture, frequently comprising different hinge and link systems, different motors to perform a vertical movement of the
30 seat and back unit as well as a tilting movement of this unit to provide a backward inclination of the patient in the upper position, relative to the position of the

patient in the lower position, where the patient is sitting "normal" or "straight" on the patient chair.

Object of the Invention

An object of the invention is to provide a patient chair which is simple in terms of construction and thus can be manufactured at low cost, said patient chair allowing movement of its seat and possibly also its back between upper and lower positions, in which upper position the patient is inclined backwards.

Summary of the Invention

The object of the invention is achieved by a patient chair having the features in claim 1. Advantageous embodiments are defined in the dependent claims.

According to the inventive idea as defined in the claims, the patient chair has but a simple chassis which allows movement of the seat between upper and lower positions, during which movement the seat - and thus the patient sitting on it - automatically is continuously gradually inclined; backwards in the movement to the upper position and forwards in the movement to the lower position. There is no noticeable change between the horizontal and the vertical movement. The movement can be made by manual power or by machinery.

Embodiments, Drawings

Embodiments of the invention will now be described with reference to the accompanying drawings, in which

Fig. 1a illustrates particularly the principle of the invention with a first embodiment of the invention in a side view;

Fig. 1b illustrates the first embodiment in a perspective view;

Figs 2a and 2b illustrate, in a side view, an embodiment which is essentially identical to the one in Figs 1a and 1b, but with a different driving device, and

Fig. 3 shows a second embodiment of the invention.

In Figs 1a, b, the patient chair 1 has a chassis 2 with a frame 3 and a vertically arched stand 4. The stand

4 is connected to a unit 5 consisting of a seat of a chair and a back of a chair 6, 7 by means of a roller bearing arrangement 8 (see in more detail Figs 2a, b), which is attached to the unit 5 and adapted to roll on the stand 4. To move the unit 5 on the stand 4, there is a drive unit, in this case a hydraulic cylinder assembly 9, the ends of which are articulated at suitable points on the chassis 2 and the roller bearing arrangement 8. It is indicated by the dashed lines in Fig. 1a that - with the drive unit activated - the unit 5 and, thus, the patient sitting on it will automatically be continuously gradually inclined backwards when moving the unit 5 from a lower position LP to an upper position HP, and vice versa when moving it in the other direction. To this end, the back 7 of the chair preferably has a curvature corresponding to the curvature of the stand 4.

As is evident from the Figures - and obvious to a person skilled in the art - the chassis 2 is designed for stability, so that the patient chair does not overturn with the patient sitting in it and being moved up and down. The convexity of the stand 4 is here directed forward, and the stand 4 is fixed to the rear portion of the frame 3.

It will also be obvious that said upper and lower positions HP, LP are not permanent but can be selected, for instance with regard to a comfortable working posture of the carer (tall or short carer) and/or with regard to the patient's comfort (the patient enduring a more or less pronounced backward/forward inclination) and with regard to the measure that is to be taken on the patient.

The roller bearing arrangement 8 is shown in more detail in Figs 2a and 2b. The hydraulic assembly 9 is here not drawn.

In Fig. 3, the stand 4 of the patient chair 1 is straight and the back 7 of the unit 5 is arched. A roller bearing arrangement 8 is mounted on the stand 4 and the back 7 of the chair to guide the unit 5 in the arcuate

path given by the curvature of the back 7 and extended between upper and lower positions. A drive unit, for instance a hydraulic cylinder assembly 9, mounted on the chassis 2 under the seat 6 is arranged to move the unit 5
5 between upper and lower positions.

The chassis 1 preferably has wheels 10 on the frame 3, thus allowing the patient chair to be wheeled. Armrests are designated 11 and pivotable footrests are designated 30.

10 A person skilled in the art realises that the unit 5 can be moved on the stand 4 by many different driving devices. For instance, a winch may connect the unit 5 to the stand 4/the roller bearing 8 and is manually operated by a crank. Instead of a roller bearing, for
15 instance a gear arrangement can be used. Of course, it is also possible to use an electric motor. A person skilled in the art is capable of applying any suitable arrangement, of which there are many, for relative movement of the unit 5 and the stand 4, by motor power or manually.
20 In case of movement by motor power, (remote) control units can be used to stop, accelerate and retard the movement.

Nor is the shown upside-down U-shape of the stand 4 necessary. The stand 4 may consist of a single upright if
25 the chassis 2 is designed with corresponding stability, to support the patient. Alternatively, the stand 4 may constitute the back 7 of the patient chair and only the seat 6 can be moved relative to this back.

The frame 2 is suitably designed so as to allow
30 the patient chair 1 to be pushed under a bed, or round a toilet. For use with a toilet, the seat 6 may have an opening 12.

It goes without saying the patient chair can also be provided with various usual leg rests, armrests and
35 headrests, which can be adjustable.

Figs 2a and 2b show another patient chair 1 according to the invention, provided with an advantageous calf

rest structure 20. The advantage resides in the fact that the calf rest structure takes up a small space in the inactive moved-away position (Fig. 2a), which is used, for instance, while a patient is made to sit in the patient chair, when transporting or storing the patient chair without a patient or when transporting a patient in the patient chair in narrow spaces, such as lifts and narrow bathrooms/lavatories. The calf rest structure 20 comprises a mounting arm 21, on which a plate-shaped calf rest pad 22 is tiltably mounted by means of a transverse arm part 21a at one end of the arm 21. The other end of the mounting arm 21 is articulated to the underside of the seat 6 by means of a hinge. The hinge comprises a sleeve 21b at said other end of the arm, in which a pin 24 engages, which is fixed to the underside of the seat 6, close to the front edge thereof, close to the corner of the seat. The hinge 21b, 24 is inclined on the seat underside in such a manner that the arm 21 and the calf rest pad 22 when pivoting from the inactive position to the active position in Fig. 2b describe a part-circular sweeping motion in the course of which the calf rest pad 22 will be moved behind the leg of a patient sitting in the patient chair. The carer may possibly have to first lift the leg somewhat. This pattern of movements for the calf rest 20 facilitates the carer's work when the patient's leg is to be put on the pad 22, especially if the seat 6 is in the raised position. As is evident from Fig. 2b, the calf rest pad 22 extends in the active position straight away from the patient chair. The active and inactive positions are end positions, defined by a slot-lug connection in the sleeve 21b and the pin 24.

Moreover, Figs 2a and 2b illustrate an electric motor winch 9 for the unit 5, the motor M being fixed to the upper part of the stand 4 and by means of a band 13 pulling and releasing, respectively, the unit 5 for movement between the lower and upper positions.

CLAIMS

1. A patient chair having
- 5 - a chassis (2) comprising a frame (3),
 - a seating device (6, 7) intended for the patient
and connected to the chassis,
 - a driving device (9) for moving the seating device
 (6, 7) relative to the frame (3) in the vertical direc-
10 tion between a lower and an upper position, in which
upper position the seating device (6, 7) and, thus, a
patient sitting in it are inclined backwards relative to
the lower position, c h a r a c t e r i s e d b y
- a stand (4) which belongs to the chassis (2) and
15 extends upwards from the frame (3),
 - an element (4, 7) which is connected to the stand
(4) and which is continuously arched,
 - means (4, 7, 8) cooperating with each other and
positioned on the stand (4, 7) and the seating device (6,
20 7), which means are arranged to guide the seating device
along the element (4, 7) in the movement of the seating
device between the lower and upper positions, so that the
seating device (6, 7) is continuously gradually tilted in
the course of its curved movement in the vertical direc-
25 tion.
2. A patient chair as claimed in claim 1, c h a r -
a c t e r i s e d in that the stand (4) itself consti-
tutes the element.
3. A patient chair as claimed in claim 1 or 2,
30 c h a r a c t e r i s e d in that the seating device (6,
7) consists of a seat (6) of a chair and a back (7) of
a chair, which form a unit (5).
4. A patient chair as claimed in any one of claims
1-3, c h a r a c t e r i s e d in that the element (7)
35 is included in said means cooperating with each other and
consists of a back (7) of a chair.

5. A patient chair as claimed in claim 1 or 2, characterised in that the element constitutes the stand (4) and consists of a back (7) of a chair, the seating device consisting of a seat (6) of a chair.

5 6. A patient chair as claimed in any one of claims 1-5, characterised in that the driving device is manual, for instance a hand-operated winch.

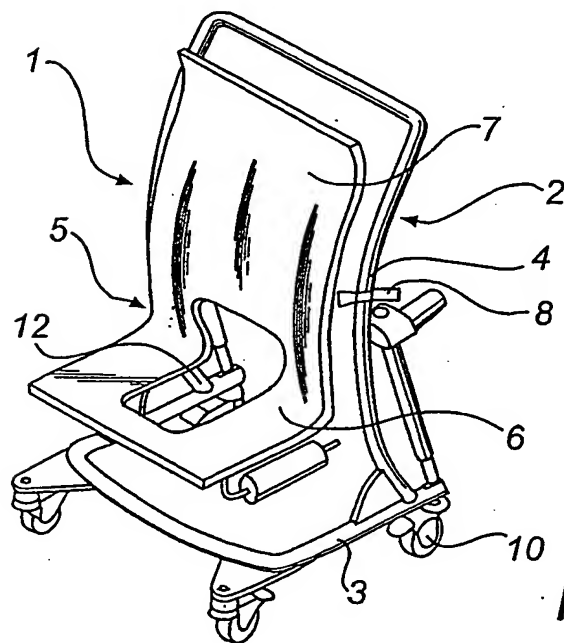
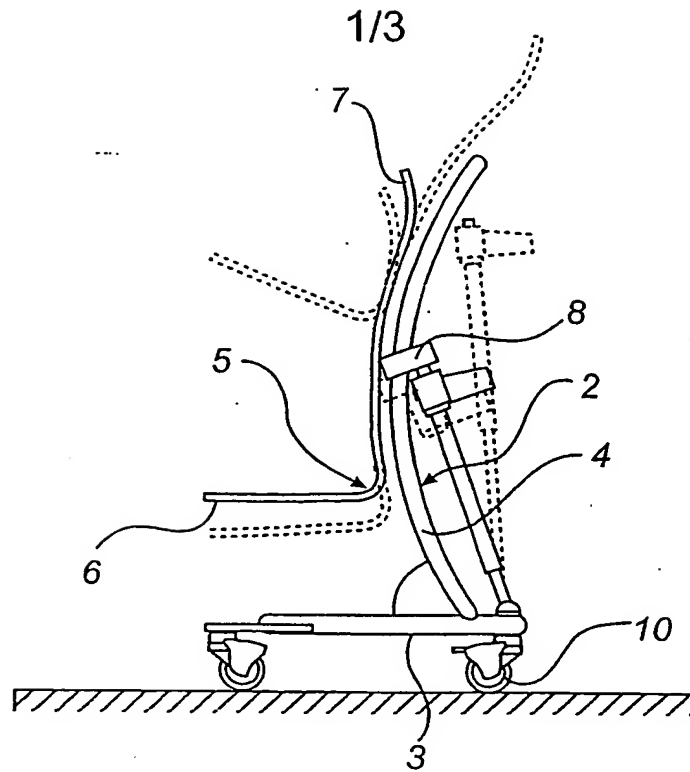
10 7. A patient chair as claimed in any one of claims 1-6, characterised in that the driving device is a machine, for instance an electric motor or a hydraulic assembly.

8. A patient chair as claimed in claim 6 or 7, characterised in that the driving device has a pulling effect on the seating device.

15 9. A patient chair as claimed in claim 6 or 7, characterised in that the driving device has a pushing effect on the seating device.

20 10. A patient chair as claimed in any one of claims 1-9, characterised in that the cooperating means comprise a roller bearing arrangement (8).

25 11. A patient chair as claimed in any one of claims 1-10, characterised in that at least one plate-shaped calf rest with a calf rest pad (21) is mounted on the patient chair, which calf rest is arranged by means of a joint arrangement (21b, 24) to be pivotable between an inactive end position where the extent of the calf rest pad (21) is essentially parallel to one side of the patient chair and the calf rest pad is located close to the patient chair, and an active end position where
30 the calf rest pad is capable of supporting the patient's leg when extended, away from the patient chair.



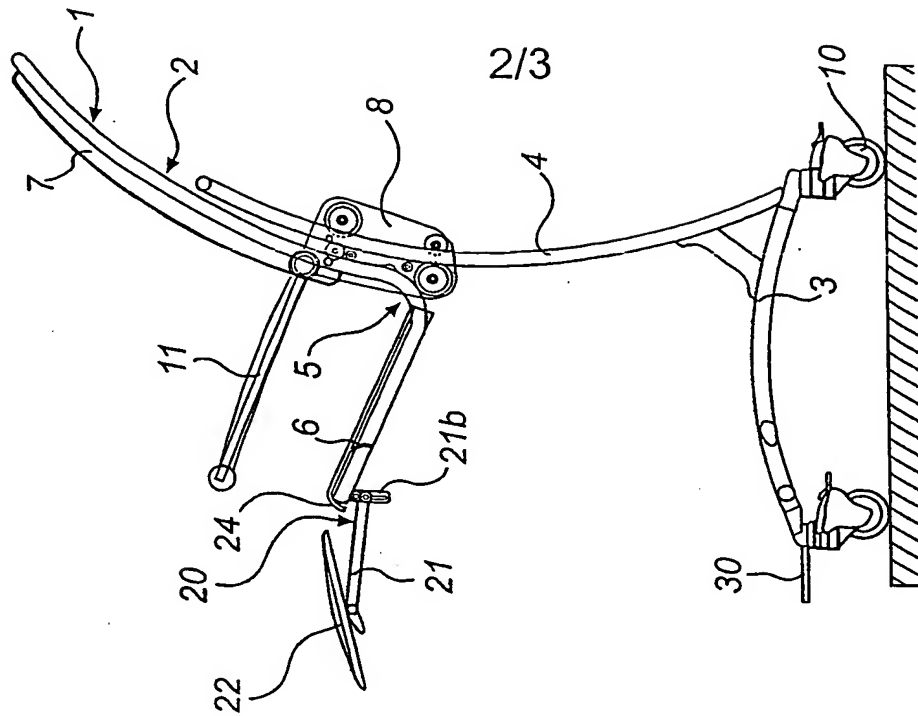


Fig. 2b

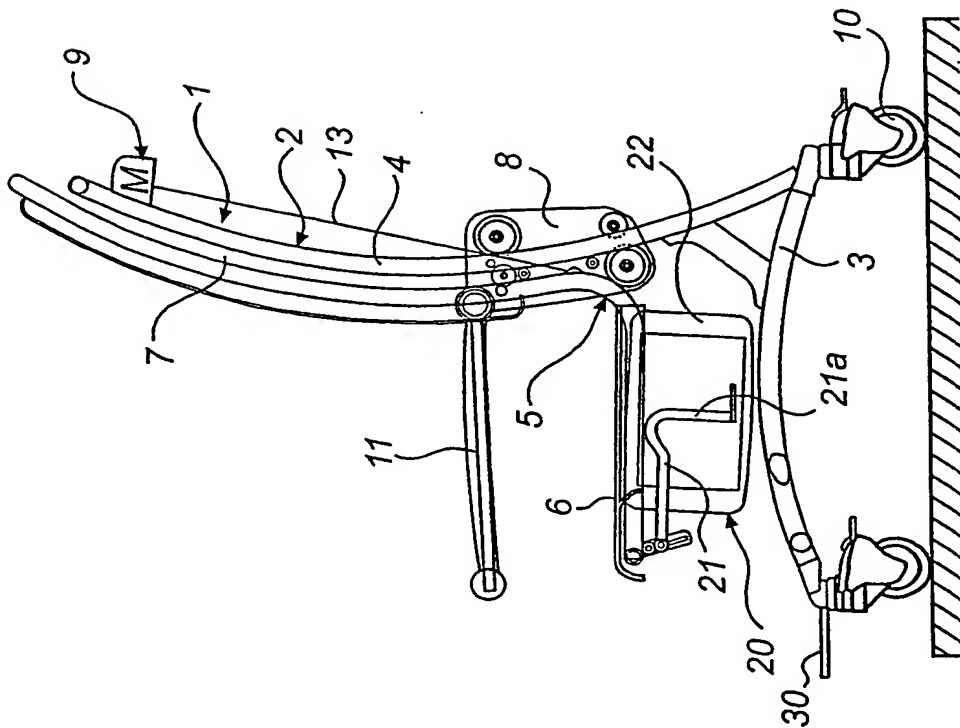


Fig. 2a

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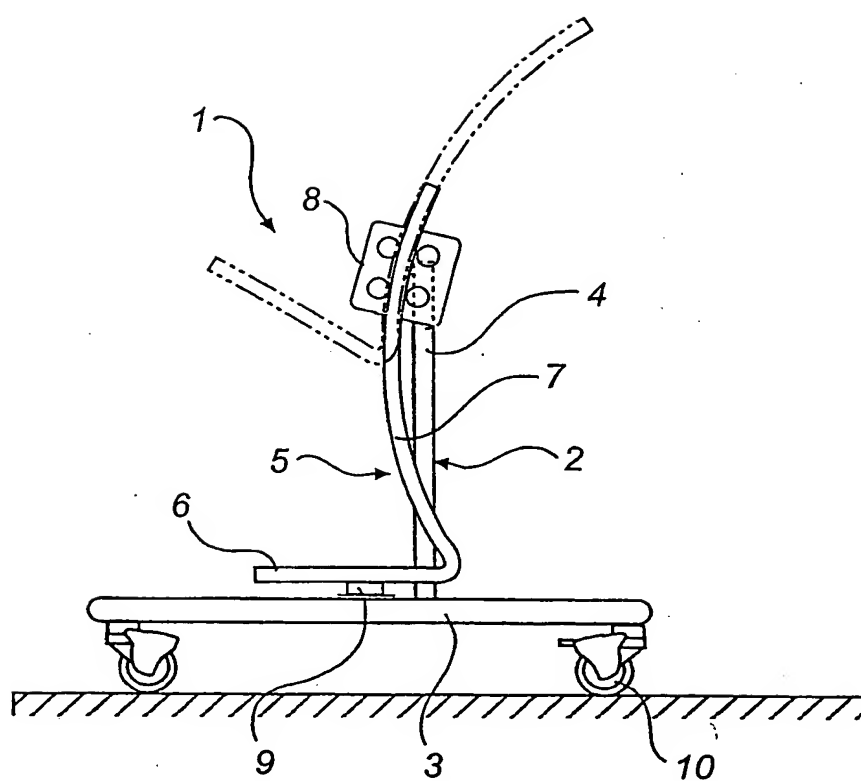


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 2004/000675

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A61G 5/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A61G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	DE 20116111 U1 (HOYER GMBH), 4 April 2002 (04.04.2002), abstract, fig. --	1-11
A	US 4399572 A (HANS A.V. JOHANSSON), 23 August 1983 (23.08.1983), abstract, fig. --	1-11
A	DE 19821451 A1 (EXEDY CORP.), 19 November 1998 (19.11.1998), abstract, fig. -- -----	1-11

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT
Information on patent family members

03/07/2004

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PCT/SE 2004/000675

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